



DISTRICT COURT, CITY AND COUNTY OF DENVER, STATE OF COLORADO

Case No. 94 CV 5459

Courtroom 7

CONSENT DECREE AND ORDER

RECEIVED

MAY 08 1996

SUNNYSIDE GOLD CORPORATION,

Plaintiff,

v.

**COLORADO WATER QUALITY CONTROL DIVISION OF THE COLORADO
DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT,**

Defendant.

**OFFICE OF THE
ATTORNEY GENERAL
NATURAL RESOURCES SECTION**

RECITALS

WHEREAS, Sunnyside Gold Corporation ("SGC"), a subsidiary of Echo Bay Inc., is a corporation duly organized and existing under the laws of the State of Delaware and having its principal place of business in San Juan County, Colorado.

WHEREAS, the Colorado Water Quality Control Division ("Division") is an agency of the State of Colorado duly created pursuant to section 25-8-301 of the Colorado Revised Statutes (1988) as part of the Division of Administration, Colorado Department of Public Health and Environment. The Division's duties include the administration and enforcement of the water quality control program adopted pursuant to the Water Quality Control Act, C.R.S. § 25-8-101 (1989) ("Act").

WHEREAS, SGC owns an inactive mining property in San Juan County, Colorado, near the City of Silverton, commonly referred to as the Sunnyside Mine ("Mine").

WHEREAS, SGC undertook mining operations at the Mine for approximately six years, from 1985 to 1991, although the Mine has operated under other owners for many decades.

WHEREAS, SGC holds two Colorado Discharge Permit System ("CDPS") permits authorizing the discharge of pollutants from the mine, in accordance with numeric effluent limits and other conditions. CDPS Permit No. CO-0027529 authorizes the discharge of Mine water through the Mine's main access portal, commonly referred to as the American Tunnel, to Cement Creek. SGC does not own all of the property drained by the American Tunnel. CDPS Permit No. CO-0036056 authorizes the discharge of Mine water through a secondary access portal, commonly referred to as the Terry Tunnel, to Eureka Gulch. SGC continues to be bound by the terms and conditions of its CDPS permits and continues to treat Mine water flows. Treatment includes creation of treatment residues which are periodically dredged and disposed of at SGC's existing tailings pond.

WHEREAS, SGC holds CDPS Permit No. CO-0000426, for the Mayflower Mill, which authorizes the discharge of pollutants from the Mayflower Mill tailings piles to the Animas River in accordance with numeric effluent limits and other conditions.

WHEREAS, SGC also holds the following CDPS stormwater permits:

(1) COR-040052 - American Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to Cement Creek in accordance with the site Stormwater Management Plan ("SWMP").

(2) COR-040053 - Ross Basin-Brenneman Vein Project Stormwater: authorizes discharges composed entirely of stormwater from the site to Cement Creek in accordance with the site SWMP.

(3) COR-040054 - Mayflower Mill Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

(4) COR-040055 - Eureka Millsite Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

(5) COR-040056 - Midway Millsite Stormwater: authorizes discharges composed entirely of stormwater from the site to the South Fork of the Animas River in accordance with the site SWMP.

(6) COR-040057 - Ransom-White Star Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to the South Fork of the Animas River in accordance with the site SWMP.

(7) COR-040058 - Terry Tunnel Stormwater: authorizes discharges composed entirely of stormwater from the site to Eureka Creek in accordance with the site SWMP.

(8) COR-040059 - Mayflower Mine Stormwater: authorizes discharges composed entirely of stormwater from the site to Arrastra Creek in accordance with the site SWMP.

(9) COR-040060 - Sunnyside Basin Stormwater: authorizes discharges composed entirely of stormwater from the site to Eureka Creek in accordance with the site SWMP.

(10) COR-040061 - Gold Prince Mine Stormwater: authorizes discharges composed entirely of stormwater from the site to Placer Gulch in accordance with the site SWMP.

(11) COR-040063 - Gold Prince Mill Stormwater: authorizes discharges composed entirely of stormwater from the site to the Animas River in accordance with the site SWMP.

WHEREAS, SGC also holds Mined Land Reclamation Permit No. M77-378 ("MLR Permit") pursuant to the Colorado Mined Land Reclamation Act, C.R.S. § 34-32-101 (1995) ("MLRA").

WHEREAS, Pursuant to the MLRA and MLR Permit, SGC has been in the process of final reclamation of the Mine, the Mayflower Mill, and the tailings impoundments at the Mayflower Mill for several years. The final reclamation plan (the "Reclamation Plan"), submitted by SGC to and approved by the Colorado Mined Land Reclamation Board, includes installation by SGC of a bulkhead at SGC's underground property line within the American Tunnel to prevent mine water from flowing directly out of the Mine workings through the American Tunnel portal to Cement Creek and installation by SGC of a bulkhead at the Terry Tunnel portal.

WHEREAS, the Division of Minerals and Geology ("DMG") recommended, and the Mined Land Reclamation Board approved, a technical revision to SGC's Reclamation Plan on November 18, 1993, specifying the details and conditions for the installation of the underground bulkheads.

WHEREAS, DMG's approval included in its rationale that indefinite or perpetual mine drainage treatment was not desirable for final reclamation and that hydraulic seals offer the best alternative for final mine site reclamation. The DMG approval rationale also stated that the physical setting of the Sunnyside Mine appeared to be ideal for a hydraulic sealing scheme.

WHEREAS, the Mined Land Reclamation Board's ("MLRB") approval of the technical revision specifically noted the disagreement between the WQCD and SGC regarding SGC's legal responsibility for CDPS permitting of seeps and springs after the sealing of the mine workings. The MLRB required that any measurable change in water quality or quantity in the seeps and springs of the drainages surrounding the Mine be monitored and reported to DMG and to the WQCD, required that SGC contact the WQCD in the event of any such measurable change to determine if a new or existing discharge permit for the Mine is necessary, and stated that responsibility for enforcement of potential discharge permit compliance problems would rest with the WQCD.

WHEREAS, since the American Tunnel was extended to the Sunnyside Mine workings in the 1950's, and today, most water in and nearby the mine area has flowed in part out of the ground through naturally occurring seeps and springs and has flowed in part through the Mine workings and American Tunnel to Cement Creek. Water has also historically drained through the Terry Tunnel to Eureka Gulch. Since at least 1985, flows from the American and Terry Tunnels have been treated at treatment plants prior to discharge in accordance with CDPS permits.

WHEREAS, installation of these bulkhead seals will impound water behind the bulkheads, eventually flooding the Mine, and at some time subsequent to initial Mine flooding, water, which is now discharged through the American Tunnel and Terry Tunnel portals pursuant to the CDPS Permits, may flow through underground fractures and fault systems which may form seeps and springs which discharge into surface waters.

WHEREAS, the Parties dispute whether or not the seeps and springs which may emerge or increase following installation of bulkhead seals in the American and Terry Tunnels would be subject to the permit requirements of the Act. The Division's position is that any such seeps or springs could be enforceable against SGC as violations of the Act as the discharge of pollutants to state waters from a point source without a permit. SGC's position is that any such seeps and springs would not be subject to the permit requirements of the Act because they would not constitute the discharge of pollutants by SGC from a point source.

WHEREAS, SGC filed a Complaint for Declaratory Relief in this case against the Division requesting that the Court determine the applicability of the permit requirements of the Act so that final reclamation could proceed.

WHEREAS, the Parties desire that reclamation of the Mine proceed to completion.

WHEREAS, SGC desires termination of CDPS Permits No. CO-0027529 and CO-0036056.

WHEREAS, to resolve this dispute, to allow SGC to proceed with final reclamation of the Sunnyside Mine, to provide for closure of the American and Terry Tunnels by hydraulic seals, to provide for mitigation of certain other historic mining conditions, to protect the

waters of the State of Colorado, and to provide for the final termination of CDPS Permits No. CO-0027529 and CO-0036056, the parties agree to the terms and conditions of this Consent Decree. For purposes of settlement, they do so without trial of any facts or legal issues. Except as set forth in this Consent Decree, the parties neither admit nor deny any factual allegations related to the closure of the American and Terry Tunnels; nor do the parties concede any disputed legal issues which have been or could have been raised in this litigation.

WHEREAS, the Parties agree that the terms, conditions, and undertakings herein will create mutual contractual rights and obligations between the Parties.

WHEREAS, the Parties consent and agree to the entry by this Court of this Consent Decree and Order.

NOW THEREFORE IT IS HEREBY ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

I. JURISDICTION

1. This Court has jurisdiction over the Parties and the subject matter of this action and decree.

II. PARTIES BOUND AND FINDINGS

2. Upon entry, this Consent Decree will apply to and be binding upon each of the Parties, and upon any successors in interest and assigns. The undersigned representatives of the respective Parties certify that they are fully authorized by the Party whom they represent to

enter into the terms and conditions of this Consent Decree, to execute this Consent Decree, and to legally bind that Party to the terms and conditions of this Consent Decree.

3. The Parties agree, and the Court finds, that the settlement embodied in this Consent Decree is lawful under the Act, is consistent with the purposes of the Act, and is intended to protect the waters of the State of Colorado.

III. DEFINITIONS

4. Words used in this Consent Decree that are defined in the Colorado Water Quality Control Act, C.R.S. § 25-8-101 ("Act") or regulations promulgated pursuant to the Act ("regulations") are defined, for purposes of this Consent Decree, as defined in the Act and regulations. Other words used in this Consent Decree are to be taken and understood in their ordinary sense unless this Consent Decree indicates that a different meaning was intended. Whenever the following terms are used in this Consent Decree, together with all documents appended hereto, the following meanings apply:

a. "Consent Decree" means this document when entered by the Court and in effect, all appendices attached hereto, and any future amendments hereto.

b. "Division" means the Water Quality Control Division of the Colorado Department of Public Health and Environment.

c. "DMG" means the Division of Minerals and Geology of the Colorado Department of Natural Resources.

d. "Field Season" means any annual construction season so long as the Consent Decree has been entered by the Court prior to June 1 of that calendar year.

e. "Parties" collectively means the Water Quality Control Division of the Colorado Department of Public Health and Environment and Sunnyside Gold Corporation.

"Party" means either of the Parties.

f. "Mitigation Project Site" means any one of the locations for the mitigation projects described in Appendix B, which includes "A" list and "B" list projects and any additional mitigation projects agreed to by the Parties pursuant to this Consent Decree.

g. "Reclamation Standards" for purposes of the mitigation projects, means sections 3.1.5 (materials handling), 3.1.9 (top soiling), 3.1.10 (revegetation), and 3.1.11 (buildings and structures) of the rules of the Mined Land Reclamation Board, 2 CCR 407-1 as they exist at the time this Consent Decree is entered by the Court.

h. "Reference Point" means the water quality monitoring station A-72 located on the Animas River, below its confluence with Mineral Creek, below Silverton, Colorado. It is also known as USGS Gage Site No. 09359020 and as the Water Quality Control Division's River Pollution System ("RPS") No. 82. The function of the Reference Point under this Consent Decree is described in paragraph 14 and in Appendix A attached hereto.

i. "Reference Water Quality" is defined as it is in Appendix A.

j. "SGC" means Sunnyside Gold Corporation.

••

k. "Work" means all remedial, mitigative, corrective, and other actions, schedules, plans, terms, and conditions prescribed by or described in this Consent Decree, documents appended hereto, and any future amendments hereto.

l. "Work Plan" means any one of the plans for remedial or mitigative work, either attached to the permit for mitigation projects which is attached as Appendix C to this Consent Decree, or submitted by SGC to the Division for approval pursuant to this Consent Decree.

m. "WQCD" means the Water Quality Control Division of the Colorado Department of Public Health and Environment.

IV. COMMITMENTS OF THE PARTIES

5. Performance and Financing of the Work. SGC will perform, or cause to be performed, the Work agreed to in this Consent Decree. SGC may undertake any portion of the Work through qualified consultants or contractors designated by SGC, provided that no such designation will relieve SGC of any of its obligations under this Consent Decree. SGC will timely finance the Work. SGC will complete the Work in accordance with the Reclamation Standards of the Colorado Division of Minerals and Geology ("DMG") and the Work Plans.

a. SGC will reimburse to the State of Colorado the actual costs for time spent for inspection of the Work performed pursuant to the Consent Decree at a rate of \$33.33 per hour, and associated expenses, up to a maximum of \$3,100 per mitigation project. SGC

will pay the amounts billed to it within thirty (30) days of receipt of those bills, as directed by the Division.

6. Maintaining Water Quality. SGC will carry out the Work required under this Consent Decree in a manner which is intended to maintain water quality in the Animas River at the Reference Point, as set forth in Appendix A hereto. SGC will monitor water quality at the Reference Point as required in paragraph 10 and statistically compare analytical results to the Reference Water Quality using the methodology set forth in Appendix A. SGC will respond to a statistically identified deterioration in water quality at the Reference Point as set forth in Appendix A. The Reference Point will not be a permit compliance point.

7. Monitoring and Completion. SGC will perform the monitoring described in paragraph 10, and, unless this Consent Decree is prematurely terminated, will certify that it has fulfilled the criteria for completion set forth in paragraph 14.

8. State Oversight and Obligations. The Division will at any time have the right to inspect any Work required of SGC under this Consent Decree and, upon request by SGC, the Division will request that DMG inspect any of the mitigation projects to determine whether the reclamation Work has been completed in accordance with the Reclamation Standards of DMG and the Work Plans.

a. Within thirty days of receipt by the Division of certification by SGC that it has completed a mitigation project or projects, the Division will request that the Work be inspected. Within thirty days after the Work has been inspected and a report provided to the Division, the Division will in writing either confirm that SGC has completed that mitigation

project or projects according to the approved Work Plans and the Reclamation Standards of the Division of Minerals and Geology or provide to SGC a written statement of the reasons why the Division believes that SGC has not done so. If the Division requests that DMG perform the inspections and DMG declines to do so, the Division will perform the inspections.

b. Within sixty days of a request by SGC, the Division will complete a Permit Termination Assessment pursuant to Section VIII of this Consent Decree.

c. Within sixty days after a Division determination of a Successful Permit Termination Assessment pursuant to Section VIII, the Division will, in accordance with then-existing procedures, commence termination of CDPS Permits No. CO-0027529 and CO-0036056 and any obligations of SGC thereunder and will complete termination in a reasonable time as permitted by its procedures. If not already accomplished, the Division will terminate the mitigation projects permit or permits and SGC will have no future obligations thereunder. The Division agrees, based on the facts of this case, that after a Successful Permit Termination Assessment and termination of these permits, no future CDPS point source permit will be required of SGC or its parent company for seeps or springs which emerge or increase in the Upper Animas River or Cement Creek drainages following installation and closure of bulkhead seals in the American or Terry Tunnels.

d. The Division will terminate CDPS stormwater permit COR-040061 (Gold Prince Mine) and that portion of CDPS stormwater permit COR-040052 (American Tunnel) covered by a mitigation project when the mitigation projects for those sites are confirmed by the Division to be completed pursuant to paragraph 8a. Termination of other

SGC stormwater permits will be governed by applicable regulations and not by this Consent Decree.

V. SUMMARY OF WORK

9. SGC, in consideration of the mutual undertakings set forth in this Consent Decree, agrees to perform the following Work:

a. American Tunnel/Terry Tunnel

During 1996, SGC will complete the seals permitted in the MLR Permit, and will close the valves at the Terry Tunnel and at the property line in the American Tunnel. Once the valves are closed, it is predicted that the mine pool will start to build and will eventually reach physical equilibrium. SGC will monitor the mine pool height. The mine pool will be considered to be at physical equilibrium when the rate of rise of the mine pool has leveled off, as defined by mutual agreement between SGC and DMG pursuant to the MLR Permit. Notice that equilibrium has been reached, as determined under the MLR Permit, will be provided by SGC to the Division within thirty days of such determination. Once the pool is at equilibrium, and after the two-year observation period required by the MLR permit, SGC will grout the valves and pipes in the bulkhead seals in the American and Terry Tunnels and place additional hydraulic seals downstream of the property line seal to eliminate the American Tunnel portal discharge and to allow final reclamation of the surface facilities as required by SGC's MLR Permit. Additional DMG approvals will be necessary for such further seals. SGC may also place infiltration controls to preclude water from entering the American Tunnel.

Should maintenance of the portion of the American Tunnel downstream of the SGC property line seal and treatment of the American Tunnel discharge be undertaken by the property owner or other parties, then SGC will be released from any continued CDPS permit obligation at the American Tunnel.

b. Mitigation Projects

SGC will undertake and timely complete mitigation projects as set forth in Appendix B. It is anticipated that completion of these projects will allow for final termination of CDPS Permits No. CO-0027529 and CO-0036056 while maintaining the Reference Water Quality in the Upper Animas Basin. SGC will complete all of the "A" List projects. Unless this Consent Decree is prematurely terminated pursuant to Section IX, SGC also will complete as many of the "B" List projects and additional mitigation projects as are necessary for achievement of permit termination pursuant to paragraph 14. SGC will have fulfilled its obligations with respect to each mitigation project when such project has been confirmed by the Division to be complete pursuant to paragraph 8a irrespective of subsequent water quality changes following such confirmation. Work Plans for each of the mitigation projects on the "A" and "B" lists are included in Appendix C and are hereby approved by the Division.

c. Cement Creek/Treatment Facility

To ensure against near-term adverse impacts on the Animas River from plugging of, and cessation of water treatment at, the American Tunnel, SGC will create a temporary water quality treatment "cushion" within the Upper Animas system to offset potential additional pollutant loading. During implementation of the mitigation projects, SGC

will divert stream flow from the mainstem of Cement Creek (including the North Fork of Cement Creek) to the current water treatment system for treatment. Upon valve closure at the Terry Tunnel and at the property line in the American Tunnel, SGC will adjust the American Tunnel treatment facility as necessary to accommodate the remaining flow from the lower American Tunnel and the diverted flow from Cement Creek. This stream diversion will be regulated in volume from essentially all stream flow in low-flow months up to the equivalent stream flow lost to the treatment system due to mine sealing during high flow. This diversion will be monitored and controlled to manage impacts at the Reference Point. Following completion of all mitigation projects on the A list, SGC may reduce or eliminate the treatment of Cement Creek at the American Tunnel treatment plant. SGC will notify the Division ten business days prior to substantially reducing the quantity of flows being treated relative to the treatment plant capacity. In its notice to the Division, SGC will provide its analysis that water quality will be maintained at the reference point (A72) with the decreased treatment of Cement Creek flows, and the amount that it intends to reduce these flows. The water treatment facility will remain in operational condition until a Successful Permit Termination Assessment pursuant to paragraph 14. Upon permit termination, the facility will be dismantled and the treatment ponds and surface disturbances reclaimed in accordance with SGC's DMG permit.

VI. MONITORING

10. Monitoring Requirements. As long as the Consent Decree is in effect, or unless otherwise agreed in writing between the parties, SGC will monitor the following sites

according to the frequencies below. Each of these sites will be monitored for the following parameters: dissolved zinc, dissolved iron, dissolved aluminum, dissolved manganese, dissolved cadmium, dissolved copper, sulfate, hardness and pH. Analysis of these parameters will be conducted using methods capable of detecting concentrations at or below the following: dissolved zinc: 10 ug/l; dissolved iron: 50 ug/l; dissolved aluminum: 50 ug/l; dissolved manganese: 50 ug/l; dissolved cadmium: 1.0 ug/l; dissolved copper: 5 ug/l; sulfate: 5 mg/l. The monitoring requirements of this Consent Decree are separate and in addition to any monitoring requirements of SGC's CDPS permits and MLR permit.

a. SGC Permitted Area

(i). American Tunnel Influent to Wastewater Treatment Facility -

Sampled monthly until no flow exists or permits are terminated. Weekly flow measurements will be taken until no flow exists or permits are terminated.

(ii). Cement Creek Influent to Wastewater Treatment Facility -

Sampled monthly while Cement Creek is diverted. Weekly flow measurements will be taken until the diversion stops.

(iii). American Tunnel Treatment Facility Effluent (CDPS Permit No. CO-0027529 Outfall 004A) - Sampled monthly.

(iv). Cement Creek below its confluence with the American Tunnel effluent (known as water quality monitoring station C-20) - Sampled monthly until Cement Creek diversion and treatment of American Tunnel waters ceases.

(v). Terry Tunnel Wastewater Treatment Facility Influent - If flow exists, inflow will be sampled monthly, when accessible, until no flow exists or permits are terminated. Weekly flow measurements will be taken when accessible until no flow exists or permits are terminated.

(vi). Terry Tunnel Wastewater Treatment Facility Effluent - If treatment is required due to flow from portal, effluent will be sampled, when accessible, monthly until no flow exists.

(vii). Monitoring required by SGC's MLR permit will continue until SGC is released from its obligations by DMG. Monitoring required by SGC's CDPS permits will continue until SGC is released from those permit obligations.

b. Mitigation Sites. The receiving stream, both upstream and downstream of, and any water flowing from, the mitigation project sites identified below, will be monitored starting in the first field season of work activity at such project, and ending two years after each project is confirmed by the Division to be completed pursuant to paragraph 8a, or, if a "B" List project, at the time of either a Successful Permit Release Assessment pursuant to paragraph 14 or a Premature Termination pursuant to Section IX. Four samples will be collected yearly with at least one at high flow and at least two at low flow.

(i). Koehler-Longfellow Portal and Mine Waste Dump.

(ii). Gold Prince Mine.

(iii). Columbus Mine.

(iv). London Mine.

c. Water quality at the three stream mouth locations identified below will be monitored by SGC every other month. Water quality monitoring at these sites will be done within 24 hours of a water quality monitoring event at the Reference Point. These three sites are currently monitored for stream flow by the USGS with funding provided by the Southwest Colorado Water Conservation District. If this USGS stream flow monitoring ceases for any reason, SGC will measure and record a stream flow measurement with each sampling event. In the event that the stream gage at any of the stream mouth locations is frozen or inoperable, flow may be estimated based on a suitable correlation with a reference gage.

(i). Water quality monitoring station A-68 on the Animas River above its confluence with Cement Creek, also known as USGS Gage Site No. 09358000.

(ii). Water quality monitoring station C-48 on Cement Creek above its confluence with the Animas River, also known as USGS Gage Site No. 093358550.

(iii). Water quality monitoring station M-34 on Mineral Creek above its confluence with the Animas River, also known as USGS Gage Site No. 09359010.

d. Water Quality Reference Point. Water quality at the Water Quality Reference Point will be sampled at the frequency set forth in Appendix A. If requested by the Division, SGC will give a one-day notice of a monitoring event and will split samples with a Division representative who may be present.

e. SGC will report results of the required monitoring to the Division by the 28th day of the month following SGC's receipt of those monitoring results. If SGC monitors any parameter more frequently than specified at the agreed locations within the basin using

approved test procedures, the results of that monitoring will also be reported to the Division.

VII. SCHEDULE

11. SGC will complete the seals in and close the valves at the Terry Tunnel and at the property line in the American Tunnel during the 1996 construction season. Treatment of Cement Creek and alkaline injection into the Mine pool (weather and conditions permitting) will begin concurrently with valve closure in the American Tunnel. The other mitigation projects will start within thirty days of valve closure in the American Tunnel and treatment of Cement Creek. Construction is confined to summer and fall months due to the heavy winter snowfalls that occur in the Upper Animas Basin.

The "A" List of primary projects will be substantially completed within the first two Field Seasons. Monitoring will begin concurrently with the commencement of Work by SGC under the Consent Decree. Upon completion of the "A" List projects, SGC will then implement as many of the "B" List projects, as needed. All "A" and "B" List projects required to maintain the Reference Water Quality will be completed in four Field Seasons. If additional mitigation projects are agreed to by the Parties pursuant to paragraph 13, a schedule for those projects will be agreed to by the Parties.

VIII. PERMIT TERMINATION ASSESSMENT

12. Permit Termination Assessment. At any time following completion of all of the mitigation projects on the "A" List, SGC may submit an application for a Permit

Termination Assessment, certifying that in its professional judgment all of the criteria of paragraph 14 have been fulfilled.

a. In the event that the Permit Termination Assessment criteria of paragraph 14 below are met, the Consent Decree Completion provisions of Section X will apply.

b. In the event that the Permit Termination Assessment criteria of paragraph 14 below are not met, the Division will specify in what respect the criteria have not been met. SGC will then determine whether to continue with this Consent Decree by identifying and undertaking additional mitigation projects on the "B" List of Appendix B, whether to undertake additional projects not on the "A" or "B" lists, or whether to proceed to premature Consent Decree termination pursuant to Section IX.

13. Additional Remediation Measures. In the event that the Permit Termination criteria of paragraph 14 below are not met following completion of all the mitigation projects on both the "A" and "B" Lists, within sixty days after the Division notifies SGC of such a determination, SGC will notify the Division whether or not it intends to propose additional remediation projects which are anticipated to have a positive impact on the water quality of the Animas River. If SGC determines that it will propose additional such projects, it will submit proposed Work Plans for such projects to the Division within sixty days of the notification or within a reasonable time frame based on the accessibility of the site for planning and the complexity of the project. These Work Plans will be in substantially the same form and will contain all of the types of information contained in the Work Plans approved by the Division

for the projects listed in Appendix B. Within sixty days of SGC's submittal of Work Plans, the Division will notify SGC whether it approves or disapproves such Work Plans, and if it disapproves, will state its reasons. The Division will not unreasonably withhold its approval. If additional projects are approved, a permit for such projects will be issued by the Division.

14. The Division will determine that there has been a Successful Permit Termination Assessment if all of the following criteria are met:
- a. Five years have elapsed from the date of valve closure at the American Tunnel property line plug.
 - b. Two years have elapsed since notice of mine pool equilibrium has been given pursuant to Paragraph 9a.
 - c. Valves and pipes in the seals in the American and Terry Tunnels have been grouted.
 - d. Hydrologic controls and seals eliminating flows from the lower American Tunnel portal have been completed, or CDPS Permit No. CO-0027529, for water treatment at the American Tunnel, will have been accepted by another party or parties.
 - e. All projects on the "A" List are confirmed by the Division to be complete pursuant to paragraph 8a.
 - f. Treatment of Cement Creek has ceased.
 - g. It is demonstrated in accordance with Appendix A that the Reference Water Quality is being maintained without continued treatment of Cement Creek.

15. The Division will determine that there has been a Failed Permit Termination Assessment if any of the criteria listed in Paragraph 14 above are not met.

IX. PREMATURE TERMINATION OF CONSENT DECREE

16. This Consent Decree may be prematurely terminated:

- a. By SGC, only after completion of all of the projects contained on the "A" List, if SGC determines that a Successful Permit Termination Assessment pursuant to paragraph 14 is not feasible.
- b. By the Division, only if SGC is not implementing the mitigation projects in accordance with the schedule established in this Consent Decree, or is not performing the mitigation projects in a workmanlike manner or in accordance with the Reclamation Standards of DMG and the Work Plans.

17. If either Party determines to prematurely terminate this Consent Decree, notification will be made and written explanation provided to the other party and to the Court at least sixty days prior to the effective date of the termination.

18. If this Consent Decree is prematurely terminated, SGC will treat any flow from the American Tunnel and the entire flow of Cement Creek up to a treatment capacity of 1800 gallons per minute in accordance with its CDPS permit for a period of thirty months thereafter. SGC's agreement to continue treatment of Cement Creek flows for thirty-month period after premature termination of this Consent Decree is made without conceding any legal responsibility other than that created by this Consent Decree to do so or any responsibility

other than that created by this Consent Decree for water quality conditions after placement of seals within the Mine. SGC specifically reserves any legal positions that it may have with respect to such issues, and nothing in this Consent Decree shall be construed as an admission or concession on such issues.

19. In the event that this Consent Decree is prematurely terminated, CDPS Permits No. CO-0027529 and CO-0036056 will remain in effect.

**X. SUCCESSFUL PERMIT TERMINATION ASSESSMENT/CONSENT
DECREE COMPLETION**

20. In the event of a Successful Permit Termination Assessment pursuant to paragraph 14, the Consent Decree will be deemed completed, at which time (a) CDPS Permits No. CO-0027529 and CO-0036056 will be terminated, (b) SGC's mitigation projects permit or permits will be terminated, (c) SGC will be released from the financial surety requirement of paragraph 25, and (d) the Court's jurisdiction will cease. Notice of termination of these permits and Agreement Completion will be provided by the Division to SGC and to the Court.

21. Public notice of termination of permits will be provided in accordance with the Act and regulations.

22. The Division agrees, based on the facts of this case, that in the event of a Successful Permit Termination Assessment and termination of these permits no future CDPS point source permits will be required of SGC or its parent company for seeps or springs which may emerge or increase in the Upper Animas River or Cement Creek drainages following installation and closure of bulkhead seals in the American or Terry Tunnels.

XI. PERMITS

23. All permits issued by the Division to SGC will be issued in accordance with all then-existing applicable statutes and regulations.

24. Permitting

a. Mitigation Projects Permit. A water quality permit substantially in the form of Appendix C will be issued by the Division to cover all of the mitigation projects contemplated by this Consent Decree. This permit will be terminated when the mitigation projects have been confirmed by the Division to be completed pursuant to paragraph 8a, and there will be no continuing obligation of SGC to maintain water quality permits or treatment at the mitigation project sites.

b. CDPS Permits Renewal. SGC will continue to operate the American Tunnel water treatment facilities until they are no longer necessary to maintain the dissolved zinc criterion at the Reference Point pursuant to Appendix A. Diversion of Cement Creek waters, which are different in character from mine water, may bring altered conditions into the American Tunnel water treatment system. Since the fourth quarter of 1993, SGC has passed all chronic Whole Effluent Toxicity (WET) tests at the Instream Waste Concentration (IWC) ratio, which demonstrates that the treated mine water discharge has not been toxic. SGC's renewal American Tunnel permit will not include WET testing after treatment of Cement Creek flow begins. The Division determined that if current treatment levels are maintained and Cement Creek flows are treated, downstream aquatic life uses will be protected. Effluent

limitations in the American Tunnel discharge permit will continue to be based on BAT standards until the permit is terminated.

c. Other Permits. All activities undertaken by SGC pursuant to this Consent Decree will be undertaken in accordance with the requirements of all applicable local, state and federal statutes, regulations, and ordinances. SGC will make timely application for any necessary permits or certifications. If other environmental permits are required for the mitigation projects, such as Section 404 permits or "reclamation only" MLR permits, the Division will cooperate with SGC in obtaining such permits from the appropriate agencies so that the projects can go forward in a timely fashion. If necessary permits for an "A" List project are ultimately denied by the responsible agency, that portion of the mitigation project will be deleted from the requirements of the Consent Decree, and an additional mitigation project will be implemented in its place. Work plans for any such projects will be submitted to the Division in accordance with paragraph 13.

XII. FINANCIAL SURETY

25. Not later than thirty days after entry of this Consent Decree, SGC will provide financial surety in the amount of \$5,000,000 in the form of an irrevocable letter of credit, in the favor of the Water Quality Control Division of the Colorado Department of Public Health and Environment, issued by a federally chartered banking institution.

a. The Division may draw on the letter of credit if SGC files for bankruptcy or becomes bankrupt and discontinues treatment of water necessary to maintain

water quality and may use the proceeds to protect the waters of the state by entering and operating the treatment facility at the American Tunnel portal and disposing treatment residues at SGC's existing tailings pond.

b. This letter of credit will provide that it is irrevocable for a minimum initial period of one year and will be automatically extended for minimum additional one-year periods unless at least ninety days prior to an expiration date, the issuing institution has provided to the Division by registered mail or by courier, notice of its election not to extend the letter of credit.

c. If the financial institution elects not to extend the letter of credit, not later than forty-five days prior to its expiration, SGC will provide a letter of credit from an alternate federally chartered banking institution, its effective date to be such that there is no lapse of time in which there exists no financial surety.

d. The Division will be entitled, and the letter of credit will provide that the Division will be entitled, to draw a draft under the letter of credit in the event that (1) the letter of credit will terminate or expire within the next ten business days; and (2) the Division has not received notice from SGC that an alternate letter of credit has been provided. In the event that the Division elects to draw any drafts under these circumstances, it will not be entitled to retain or use any portion of the proceeds of the drafts unless the provisions of paragraph 25a are met. Instead, the Division will immediately deposit all of the proceeds of any drafts so obtained into one or more accounts. The amounts deposited in these accounts will serve as surety for SGC's obligations pursuant to paragraph 25. The Parties will

simultaneously enter into an escrow agreement with respect to each account that contains proceeds of the drafts on the same terms and conditions as for the above letter of credit, except that SGC will be entitled to withdraw the escrowed amount immediately to the extent that it provides a letter of credit to the Division from an alternate financial institution pursuant to this paragraph.

e. The Division will be entitled, and the letter of credit will provide that the Division will be entitled, to draw a draft under the letter of credit when its draft is accompanied by a signed statement by the Executive Director of the Colorado Department of Public Health and Environment or their designated representative and the Attorney General of the State of Colorado or their designated representative, certifying as follows:

We hereby certify that the State of Colorado is entitled to perform certain actions pursuant to paragraph 25a and/or 25c of the Consent Decree entered into by the State and Sunnyside Gold Corporation and the amount of the accompanying draft under letter of credit no. _____, dated _____, is anticipated or estimated to be necessary for the State's performance of these actions.

f. In the event that the Division draws upon the financial surety pursuant to either paragraph 25a or 25c above, the amounts will be placed in a custodial fund for its use pursuant to this Consent Decree.

g. SGC may terminate the financial surety at any time following a Successful Permit Termination Assessment pursuant to paragraph 14.

XIII. FORCE MAJEURE

26. Definition of force majeure. Force majeure is defined, for the purposes of this Consent Decree, as an event, circumstance, or condition arising from cause(s) beyond the control of the Party asserting these force majeure provisions that prevents the performance of any obligation in this Consent Decree, or that causes delays in the performance of such an obligation that cannot be avoided through the exercise of due care. Force majeure will not include increased costs or expenses associated with the implementation of this Consent Decree, or changed financial circumstances; or the failure to apply in a timely manner for any required governmental permit, license, land use authorization or entitlement, or failure to make timely provision of all information required therefor; or the failure of SGC to obtain access on mitigation project sites not owned by it, thus preventing it from doing the project; or the failure of SGC to obtain access for the Division on mitigation project sites not owned by it pursuant to paragraph 34, thus preventing the Division from inspection of the project. Force majeure for the Division will not include lack of agency financial or staff resources.

27. Effect of force majeure. A force majeure will excuse either Party from timely performance of a particular obligation under this Consent Decree for that time during which the force majeure is in effect.

XIV. ENFORCEMENT OF CONSENT DECREE

28. Remedies for Breach. In the event that either Party breaches any term or condition of this Consent Decree, the nonbreaching Party may seek any appropriate relief in

this Court, including specific performance of obligations under the Consent Decree and relief pursuant to the contempt powers of this Court.

29. Effect of Bankruptcy Petition. The obligations imposed by this Consent Decree require the performance by SGC of actions which are reasonably designed to protect public health, welfare and the environment. Any enforcement of the obligations imposed by this Consent Decree constitutes, solely for the purposes of 11 U.S.C. § 392(b)(5) (1988), the enforcement of a judgment, other than a money judgment, obtained in an action to enforce the State's regulatory and police powers.

30. Conflict Between Consent Decree, Appendices, CDPS Permits and Work Plans. In the event of conflict between any requirement, term, condition, or provision of this Consent Decree and any requirement, term, or provision of any Work Plan, or of any appendix to this Consent Decree, or provision of any CDPS permit issued by the Division to SGC, the requirements, terms, conditions, and provisions of this Consent Decree will control. However, to the extent that such a permit is more specific than, or contains additional requirements, terms, conditions, and provisions not included in this Consent Decree, those requirements, terms, conditions, and provisions of the permit will be given effect.

XV. MUTUAL RELEASE AND COVENANT NOT TO SUE

31. Covenant-Not-To-Sue. In consideration of the actions to be performed by SGC under this Consent Decree, the Division covenants not to sue or to take administrative action against SGC for seeps or springs which may emerge or increase in the Upper Animas River or

Cement Creek drainages following installation of bulkhead seals in the American or Terry Tunnels, during the term of this Consent Decree and thereafter, if SGC fulfills the requirements of the Consent Decree, there is a Successful Permit Termination Assessment pursuant to paragraph 14 and permit termination is achieved. If this Consent Decree terminates other than through termination of the permits, the Division covenants not to sue or to take administrative action against SGC for actions taken or work performed by SGC pursuant to the terms of this Consent Decree, provided that the Work was performed in a workmanlike manner and in conformance with the Work Plans and DMG Reclamation Standards. Specifically, the Division will not assert in any administrative or judicial action that the acceleration of mine pool filling by injection of water, and the addition of alkalinity to such water, has caused the mine pool to become a treatment facility subject to point source discharge permit requirements.

XVI. INDEMNIFICATION

32. Indemnification of State by SGC. SGC agrees to hold harmless and indemnify the State against all claims for damages by non-parties to this Consent Decree to the extent that such claims arise from the acts or omissions of SGC, its agents, contractors, consultants, and employees in carrying out the mitigation projects required by or undertaken pursuant to any provision of this Consent Decree and its appendices. In consideration of actions to be performed by DMG under this Consent Decree, SGC covenants not to sue DMG for activities performed or not performed by DMG or related to this Consent Decree.

33. Nothing in this Consent Decree will be construed to limit the enforcement or other authorities of the Division except as provided in this Consent Decree. Nothing in this Consent Decree will be construed to limit the authority of any other Department or Division of the State of Colorado.

XVII. ACCESS

34. SGC will provide access to the mitigation project sites owned by SGC, excluding office areas, to the State, its Counsel, and such agents or consultants as the Attorney General or the Director of the Division may designate for monitoring the Work or the conditions which are addressed pursuant to this Consent Decree. SGC will use its best efforts to secure such access on mitigation project sites not owned by SGC.

XVIII. NOTICE TO PARTIES

35. Any notice, communication, or certification to be given pursuant to this Consent Decree will be in writing and will be given either in person or by certified mail, to the following persons at the following addresses, or to such other persons or addresses as the Parties may designate by providing written notice to the other party.

a. Notice to SGC will be given to:

William B. Goodhard, Manager
Sunnyside Gold Corporation
P.O. Box 777
Silverton, CO 81433

William C. Robb, Esq.
Dufford & Brown, P.C.
1700 Broadway, Suite 1700
Denver, CO 80290-1790

b. Notice to the Division will be given by providing copies to each of the following:

J. David Holm, Director
Water Quality Control Division
Colorado Department of Public Health
and Environment
4300 Cherry Creek Drive South
Denver, CO 80222

Robert J. Shukle, Chief
Permits and Enforcement Section
Water Quality Control Division
Colorado Department of Public Health
and Environment
4300 Cherry Creek Drive South
Denver, CO 80222

Karen A. Kishbaugh
Assistant Attorney General
Natural Resources Section
Office of the Attorney General
1525 Sherman Street, 5th Floor
Denver, CO 80203

XIX. AMENDMENT OF CONSENT DECREE

36. The Parties may jointly petition the Court for amendment of this Consent Decree. Any amendment to any portion of this Consent Decree or any of its appendices must be in writing, must be approved by Court order, and will have as its effective date the date such order is entered by the Court or such other date as the Court may order.

**XX. RETENTION OF DISTRICT COURT JURISDICTION/
DISPUTE RESOLUTION**

37. Retention of District Court Jurisdiction/Dispute Resolution. This Court will retain jurisdiction over this Consent Decree for the purpose of resolving any disputes regarding the interpretation or requirements of this Consent Decree and to resolve any disputes which may arise between the parties pursuant thereto. Any such dispute may be brought before the Court by a written motion from either party and the procedure for resolution of the dispute will be determined by the Court.

XXI. EFFECTIVE DATE

38. This Consent Decree shall become effective upon the date of its entry by the Court.

XXII. GOVERNED BY COLORADO LAW

39. The Consent Decree will be governed by the laws of the State of Colorado and will be interpreted consistent therewith.

XXIII. LIST OF APPENDICES

40. List of Appendices.
- A. Definition of water quality reference point;
 - B. List of mitigation projects;
 - C. Permit for mitigation projects with attached Work Plans;

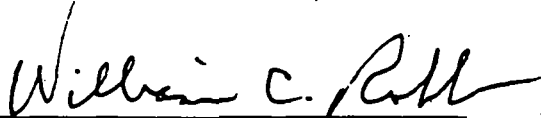
D. Renewal CDPS Permit No. CO-0027529.

SO ORDERED this _____ day of _____, 1996.

District Court Judge

The undersigned parties hereby consent to the entry by the Court of this Consent Decree in the case of Sunnyside Gold Corporation v. Colorado Water Quality Control Division, Colorado Department of Public Health and the Environment, # 94 CV 5459, District Court, City and County of Denver.

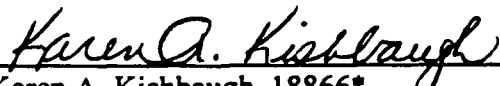
DUFFORD & BROWN, P.C.


William C. Robb, 5898
1700 Broadway, Suite 1700
Denver, CO 80290-1701
Telephone: (303) 861-8013

ATTORNEYS FOR SUNNYSIDE GOLD CORPORATION

OFFICE OF THE ATTORNEY GENERAL

GALE A. NORTON
Attorney General
TIMOTHY M. TYMKOVICH
Solicitor General
JENNIFER L. GIMBEL
Deputy Attorney General
MARTHA E. RUDOLPH
First Assistant Attorney General

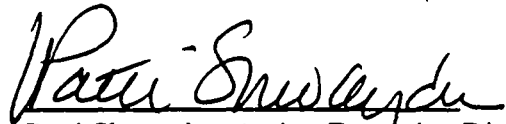

Karen A. Kishbaugh, 18866*
Assistant Attorney General
Natural Resources Section

ATTORNEYS FOR WATER QUALITY CONTROL DIVISION
1525 Sherman Street, 5th Floor
Denver, CO 80203
Telephone: (303) 866-5072
*Counsel of Record

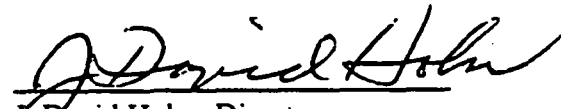
SUNNYSIDE GOLD CORPORATION


Richard C. Kraus, President

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT


Patti Shwayder, Acting Executive Director.
Colorado Department of Public Health and Environment

WATER QUALITY CONTROL DIVISION OF THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT


J. David Holm, Director
Water Quality Control Division
Colorado Department of Public Health and Environment

APPENDIX A

Reference Water Quality

A-1 Definition of "Reference Water Quality" and the Time Periods of Concern

"Reference water quality" is defined as a statistical determination of dissolved zinc (Zn) concentrations at reference point A-72 for the time period of January 5, 1989 through September 6, 1995. During this time there exist 63 measurements of dissolved zinc at the reference point which also have either simultaneous measurements of stream flow or inferred stream flows based on linear regression analysis of flow data from the Howardsville Station to Station A72. The set of 63 measurements of coupled flow and dissolved Zn data collected is termed "the baseline set" representing the available history of dissolved Zn and stream flow at the reference point. This set of data defines reference water quality against which future water quality will be compared. The reference water-quality data are listed in Attachment 1.

Time following the signing of a Consent Agreement between the State of Colorado and Sunnyside Gold Company (SGC) shall be divided into two periods:

- ▶ "Project period" is defined to be the time period that begins with the initiation of mine closure and reclamation activities that are the subject of the Consent Agreement and ends when (a) A-list projects have been completed; (b) mine pool equilibrium has been reached; (c) Cement Creek treatment has ceased; and (d) lower American Tunnel hydrologic controls and portal plug are complete.
- ▶ "Post-project period" is defined to be the time period that begins immediately after the "project period" and ends when SGC has been released from water-quality permits under the terms of the Consent Agreement.

A-2 Classes of Flow

The high-mountain portion of a river such as the Animas is subject to seasonal fluctuations in flow due to hydrologic response of the basin to climatic factors. Flow and the concentration of dissolved constituents in any river water are generally inversely related.

Based on measurements of stream flow at reference point A-72 from 1991-1995, flow conditions at this point on the Animas consist of three classes:

- ▶ Low Flow (stream flow < 100 cubic feet per second)
- ▶ Intermediate Flow (100 cfs < stream flow < 300 cfs)
- ▶ High Flow (stream > 300 cfs)

Each of these classes of flow conditions represents a physical response to the complex factors that may govern interactions between meteoric water and the geology. It is appropriate to evaluate water quality separately for each of the three classes.

A-3 Method for Evaluating Water Quality with Respect to Reference Conditions During the Project Period

- (a) Each month during the project period, SGC will collect a water-quality sample at Station A72. Analyses shall be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been approved by the Division. SGC will obtain the stream-flow datum that applies to the relevant sampling event from the USGS data collection system. In the event that the stream gage at A-72 is frozen and/or inoperable yet a water sample is obtained, flow may be estimated.
- (b) SGC will report the flow value and the dissolved zinc value in a written submittal to WQCD. The submittal will be presented together with the next monthly Discharge Monitoring Report that is due to WQCD following receipt by SGC of the laboratory report for the dissolved zinc value. Records of monitoring information shall include:
 - 1. The date, exact place, and time of sampling or measurements;
 - 2. The individual(s) who performed the sampling or measurements;
 - 3. The dates the analyses were performed;
 - 4. The individual(s) who performed the analyses;
 - 5. The analytical techniques or methods used; and
 - 6. The results of such analyses.
- (c) In addition to reporting the data, SGC will calculate and report an analysis of the data in the following form:
 - ▶ Each month, SGC will calculate an index value representing relative number of standard deviations of the observed value of dissolved Zn from the mean value of dissolved Zn for the appropriate flow class in the reference water-quality set. The index number is calculated as:

$N_i = (x_i - \bar{x}_r) / s_r$ where

N_i is the index number;

x_i is the observed value of dissolved Zn for the reporting period or the average of dissolved Zn values if more than one sample is taken in the reporting period;

\bar{x}_r is the mean value of dissolved Zn in the reference water-quality set for the flow class to which the observed value belongs; and

s_r is the standard deviation of dissolved Zn in the reference water-quality set for the flow class to which the observed value belongs.

- ▶ The index numbers will be plotted against the sampling period number (which begins with the number 1 as the first sampling event of the project period) on a graph which has the index number (called "normalized residual") as the ordinate and the sampling period number as the abscissa. An example of such a graph is shown on Figure 1a.
- ▶ SGC will compute a 12-month moving average of the index numbers, as follows. Beginning with the twelfth (12th) month of the project period, SGC will compute the mean of the index numbers for the 12-month period. In each subsequent month, the oldest index number will be dropped and the newest index number added to the set of 12 from which the mean index number is being computed.
- ▶ The moving-average index number also will be plotted over time, as shown in the example of Figure 1b.

(d) Evaluation of the normalized data will be performed as follows:

- ▶ If a single observation has an index number greater than +2.0 (i.e., that observation has a concentration of dissolved Zn greater than 2 standard deviations above the mean value of dissolved zinc for the relevant flow class in the data of the reference water-quality set), SGC will have a repeat analysis done on the sample.
- ▶ If two out of three consecutive observations have index values greater than +2.0, then SGC will report by the 28th day of the month following receipt of the second of those observations:

1. which subbasin is experiencing the increase;
2. the nature of the ongoing remediation activities in the affected basin(s); and
3. known activities not related to mine closure taking place in the affected basin.

If the increase is related to mine closure, SGC will specify the actions and time table to be implemented to reverse the trend.

- ▶ If the moving average index number of the most recent 12-month period exceeds a value of +0.577 (representing the upper value of the range of normalized residual values expected in a twelve-period sample at a confidence level of 97.5% around the mean computed on a flow class - by - flow class basis), SGC will meet with WQCD to discuss the data and determine what, if any action is required. The initial action, if any is deemed necessary, will be for SGC to investigate possible causes of the elevated Zn values. If the cause is related to the sealing of the mine or due to mitigation projects, SGC will respond either by increased treatment of Cement Creek, adjustment of the water elevation of the mine pool, or implementation of the "B" list of projects. If the "B" list of projects already has been completed, SGC may add additional mitigation projects under Paragraph 13.
- ▶ Should new, adverse effects on dissolved Zn values in the Upper Animas Basin occur through man-made or natural causes that are not caused by closure activities of the Sunnyside Mine or mitigation activities carried out by SGC under this Agreement, SGC will document and monitor the causes and their effects so that a mathematical adjustment can be made to the observational data at A72 prior to using the information in statistical analyses of water quality.

A-4 Method of Evaluating Water Quality with Respect to Reference Conditions - Post Project Period

- (a) During the Post-Project Period, SGC will collect at least 13 samples during the low-flow class and 12 samples in each of the medium and high-flow classes, subject to the following conditions:
 - ▶ The sample interval shall be \geq seven (7) days;

- ▶ The sample interval shall be \leq forty-five (45) days (in the event of extreme winter conditions at A-72, the 45 day maximum may be extended);
 - ▶ The post-project monitoring period will be at least two (2) years.
- (b) Computation and graphing of the index numbers (as described in Section A-3 above) will continue through the post-project period.
- (c) When the conditions of A-4(a) have been met and SGC is satisfied that the closure activities have met the permit release criteria of paragraph 14 of the Consent Decree, SGC may present an analysis of the post-project period, as follows:
- ▶ For each flow class in the post-project period, SGC will compile the observed values of dissolved zinc and compute the mean and standard deviation of those values.
 - ▶ For each flow class, the average dissolved zinc concentration of the post-project period will be compared to the average dissolved zinc concentration of the equivalent flow class in the reference water-quality set using a one-sided t-test for the difference of two means at the 0.05 significance level using the procedure of paragraph 3-3.2.1 of National Bureau of Standards Handbook 91, Experimental Statistics (1966, p. 3-34); see Attachment 2.
- (d) If the conditions of paragraph 14 of the Consent Agreement have been met and the statistical tests of Section A-4(c) show that there has not been a statistically discernible increase in dissolved Zn concentrations at the reference point, SGC will be entitled to permit release under the terms of paragraph 8 of the Consent Agreement.

Attachment 2

Application of the One-sided T-test to Dissolved Zinc Concentrations at A-72

For each flow class:

- (1) Compile the dissolved Zn data for the two data sets, and calculate for the number of samples each set.
- (2) Let α , the significance level of the test, be 0.05.
- (3) Look up $t_{1-\alpha}$ for $df = n_R + n_M - 2$ in Table A - 4 of NBS - 91, where

df = degrees of freedom;

n_R = number of samples in the reference set; and

n_M = number of samples in the monitoring set.

- (4) Compute the mean (\bar{x}_R and \bar{x}_M) and variance (s^2_R and s^2_M) for the reference (R) and monitoring (M) sets.
- (5) Compute the pooled variance of the two data sets

$$sp = \sqrt{\frac{(n_R - 1)s^2_R + (n_M - 1)s^2_M}{n_R + n_M - 2}}$$

- (6) Compute the test statistic, u

$$u = t_{1-\alpha} * sp * \sqrt{\frac{n_R + n_M}{n_R * n_M}}$$

- (7) If $(\bar{x}_M - \bar{x}_R) > u$, decide that the average of the post-closure monitoring period exceeds that of the reference water quality set; otherwise, decide that there is no reason to believe that the average of the post-closure monitoring period exceeds the average of the reference water quality set.

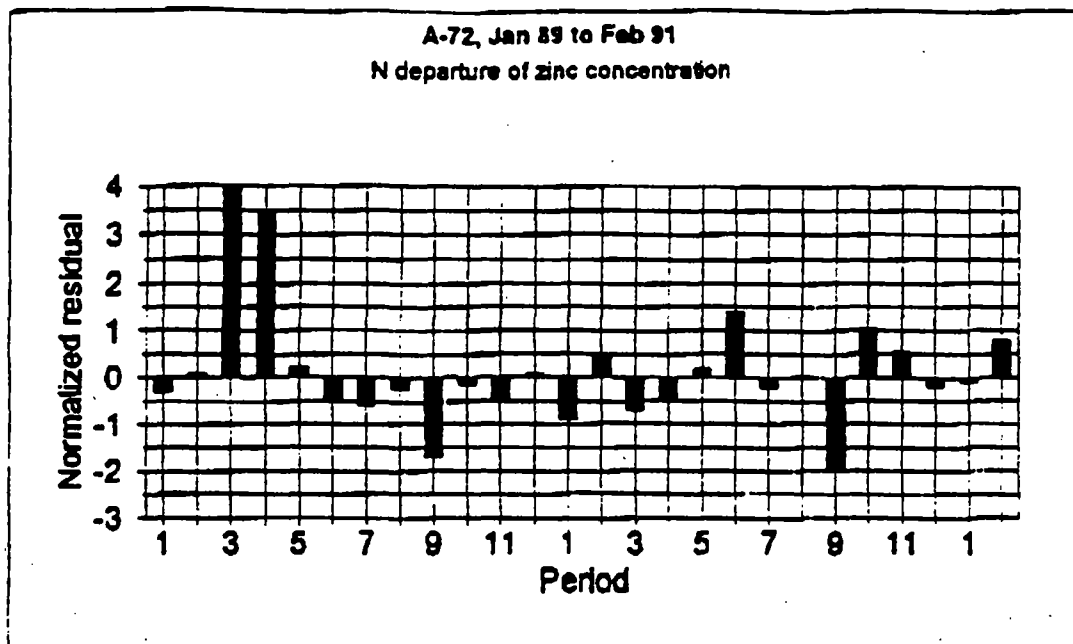
REFERENCE WATER QUALITY DATA - BY DATE						
DATE	Q	ZN				
5-Jan-89	30	510				
14-Feb-89	22	550				
7-Mar-89	17	940				
24-Apr-89	216	670				
30-May-89	1125	320				
29-Jun-89	472	240				
24-Jul-89	226	300				
2-Aug-89	385	270				
4-Sep-89	69	370				
5-Oct-89	87	360				
2-Nov-89	40	490				
13-Dec-89	22	550				
10-Jan-90	20	450				
6-Feb-90	14	590				
5-Mar-90	14	470				
19-Apr-90	51	490				
2-May-90	72	560				
14-Jun-90	1238	450				
12-Jul-90	312	350				
1-Aug-90	93	380				
4-Sep-90	69	340				
8-Oct-90	231	520				
7-Nov-90	98	450				
17-Dec-90	46	520				
16-Jan-91	38	530				
18-Feb-91	27	620				
5-Sep-91	131	380				
6-Sep-91	185	370				
7-Sep-91	261	310				
9-Sep-91	269	260				
10-Sep-91	263	270				
21-Oct-91	75	400				
30-Apr-92	512	440				
26-May-92	865	220				
23-Jun-92	854	240				
24-Jun-92	874	290				
25-Jun-92	905	160				
23-Jul-92	372	240				
19-Aug-92	134	360				
24-Sep-92	121	370				
14-Oct-92	80	480				
15-Oct-92	78	510				
22-Oct-92	83	470				
15-Jun-93	2090	180				
20-Jul-93	434	290				
21-Jul-93	434	260				
23-Aug-93	209	270				
28-Sep-93	124	370				

DATE	Q	ZN						
10-Nov-93	86	520						
29-Mar-94	80	670						
16-May-94	654	510						
18-May-94	603	500						
2-Jun-94	1370	300						
27-Jun-94	677	200						
18-Jul-94	173	300						
26-Jul-94	159	360						
28-Sep-94	143	370						
9-Nov-94	106	550						
18-Jan-95	72	680						
7-Feb-95	90	600						
12-Apr-95	127	790						
21-Jun-95	1950	350						
6-Sep-95	239	360						
SORTED BY FLOW IN EACH FLOW CLASS								
Q < 100 cfs			100 cfs < Q < 300 cfs			Q > 300 cfs		
DATE	Q	ZN	DATE	Q	ZN	DATE	Q	ZN
6-Feb-90	14	590	9-Nov-94	106	550	12-Jul-90	312	350
5-Mar-90	14	470	24-Sep-92	121	370	23-Jul-92	372	240
7-Mar-89	17	940	28-Sep-93	124	370	2-Aug-89	385	270
10-Jan-90	20	450	12-Apr-95	127	790	20-Jul-93	434	290
14-Feb-89	22	550	5-Sep-91	131	380	21-Jul-93	434	260
13-Dec-89	22	550	19-Aug-92	134	360	29-Jun-89	472	240
18-Feb-91	27	620	28-Sep-94	143	370	30-Apr-92	512	440
5-Jan-89	30	510	26-Jul-94	159	360	18-May-94	603	500
16-Jan-91	38	530	18-Jul-94	173	300	16-May-94	654	510
2-Nov-89	40	490	6-Sep-91	185	370	27-Jun-94	677	200
17-Dec-90	46	520	23-Aug-93	209	270	23-Jun-92	854	240
19-Apr-90	51	490	24-Apr-89	216	670	26-May-92	865	220
4-Sep-89	69	370	24-Jul-89	226	300	24-Jun-92	874	290
4-Sep-90	69	340	8-Oct-90	231	520	25-Jun-92	905	160
2-May-90	72	560	6-Sep-95	239	360	30-May-89	1125	320
18-Jan-95	72	680	7-Sep-91	261	310	14-Jun-90	1238	450
21-Oct-91	75	400	10-Sep-91	263	270	2-Jun-94	1370	300
15-Oct-92	78	510	9-Sep-91	269	260	21-Jun-95	1950	350
14-Oct-92	80	480				15-Jun-93	2090	180
29-Mar-94	80	670						
22-Oct-92	83	470						
10-Nov-93	86	520						
5-Oct-89	87	360						
7-Feb-95	90	600						
1-Aug-90	93	380						
7-Nov-90	98	450						
Mean		519			399			306
Std Dev		124			144			104

Figure 1

1/11/96

1a.



1b

